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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,367	10/28/2003	Oswin Ottinger	SGL 02/24	5955

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EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/695,367

Applicant(s)

OTTINGER ET AL.

Examiner

Kallambella Vijayakumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-13 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

- Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been received with the application.
- Claims 1-13 are currently pending with the application.
- The examiner has considered the IDS filed 10/28/2003 and 08/30/2004.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-2 and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108).

The prior art teaches a shape stabilized latent heat storage device comprising SBS rubber, paraffin (PCM) and expanded graphite (EG) in the ratio of 80:20:5/3 parts by weight respectively (Page-103, Abstract; Page 104, Sec. 2.1 and 2.3, Page-106, Sec 3.2). The particle size of the expandable graphite was 300 microns. The component ratios meet the ratio limitation in claim-2. Paraffin meets the limitation of PCM in claim-7.

With regard to claims 8-11, the prior art teaches making a cylindrical device by mixing the components and molding the composition (Page-104, Sec. 2.3, Page-105, Sec 2.5).

All the limitations of the instant claims are met.

The reference is anticipatory.

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2. Claims 1 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Neuschutz (US 2002/0060063).

The prior art teaches a mixture composition comprising expanded compressed graphite with a bulk density of 0.2 g/cc and a PCM material of $\text{LiNO}_3/\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$. All the limitations of the instant claims are met.

The reference is anticipatory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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1. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al (Energy Conversion and Management, January 2002, (43), Pages 103-108) in view of Neuschutz et al (US 2002/0033247).

The disclosure by Xiao et al on the composition and making of the a latent heat storage device as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art fails to teach the addition of a nucleating agent per claim-3.

In the analogous art, Neuschutz et al teach the addition of axillaries such as nucleating agents to the compositions containing liquid-solid PCM's containing graphite (Para 0035; 0040-0041).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to include nucleating agents in the latent heat storage device of Xiao with reasonable expectation of success because it is a solid-liquid type PCM device and the combined prior art teaching is suggestive of the claimed composition.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neuschutz et al (US 2002/0060063) in view of Neuschutz et al (US 2002/0033247).

The disclosure on the composition of the mixture by Neuschutz et al as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art fails to teach the addition of a nucleating agent per claim-3.

In the analogous art, Neuschutz et al teach the addition of axillaries such as nucleating agents to the compositions containing liquid-solid PCM's containing salts and graphite (Para 0035; 0040-0041).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to include auxiliaries of nucleating agents in the Mixture of Neuschutz (US-063) with reasonable expectation of success because the combined prior art teaching is suggestive of the claimed composition.

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3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neuschutz et al (US 2002/0060063).

The disclosure on the composition of the mixture by Neuschutz et al as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art is silent about the particle size of the expanded graphite in the composition.

The claimed particle size would be obvious over the technical data for the expanded graphite available from Timcal, that shows a Scott density of 0.03 g/cc and a particle size with a d50 of 36.1 microns, and it would have been obvious to use such commonly available materials in the art composition.

4. Claims 5-6 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xiao et al.

The disclosure by Xiao et al on the composition and making of the a latent heat storage device as set forth in rejection-1 under 35 USC 102(b) is herein incorporated.

The prior art is silent about the bulk density of the expanded graphite in claims 5 and 6, or making the device by molding per claims 12-13

The prior art teaches using a commercially available expanded graphite with a particle size of 300 micron in the composition after exfoliation and such materials have a typical density of 2-7 g/l and a particle diameter of less than 500 microns (Tamme, Workshop on Thermal Storage for Trough Power Systems, Feb. 20-21, 2003, Golden CO, Page-17) and the instant claimed bulk densities would be obvious in the art composition.

With regard to method claims 12-13, the prior art teaches molding the product into a shape and it would have been obvious to use common molding techniques such as injection molding which was commonly used for molding graphite products at the time of the disclosure of the invention by the applicants (Hayward, US 5,882,570, Abstract).

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Allowable Subject Matter

Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art neither teaches nor fairly suggest a mixture containing particles of expanded graphite, PCM and the specific amount of the nucleating agent in the mixture.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8-5.30 Mon-Thu, 8-4.30 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV
March 18, 2006.

Douglas McGinty
Supervisory Patent Examiner
Art Unit 1751